PATENT ABSTRACTS OF JAPAN

(11)Publication number : 08-191423

(43)Date of publication of application : 23.07.1996

(51)Int.Cl. H04N 5/765
H04N 5/781
G09G 5/24
H04N 5/92
H04N 7/30

(21)Application number : 07-001906

(22)Date of filing : 10.01.1995

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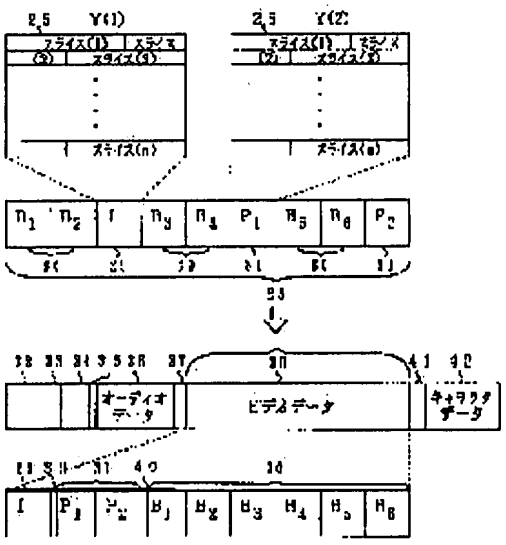
(54) OPTICAL DISK RECORDING AND REPRODUCING METHOD

(57)Abstract:

PURPOSE: To realize an optical disk recording and reproducing method in which a sharp character is displayed and character information is displayed at a designated location, in a size or color without the need for a storage means of font data.

CONSTITUTION: A storage area for a character header 41 and character data 42 is provided on a Group of pictures(GOP) 23, digital video information (GOP) recorded on an optical disk is detected by a scanning spot of an optical head and reproduced. The reproduced GOP information is given to an error correction circuit, in which the information is correction-processed and distributed in a data division circuit. Detailed control data are extracted from character information at a character header analysis circuit. A CPU gives data comprising a display control command and bit information or the like to a character generator and the data are displayed on a monitor.



LEGAL STATUS

[Date of request for examination] 27.12.2001

JAPANESE [JP,08-191423,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS OPERATION EXAMPLE DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the record playback approach of an optical disk.
[0002]
[Description of the Prior Art] Drawing 6 is the Brock circuit diagram of the optical disk record regenerative apparatus shown in JP,4-114369,A. An A/D converter for 1 to change a video signal, an audio signal, etc. into digital information in drawing, The A/D converter from which 2 changes character information, such as text, into digital information, A frame sector conversion means by which the encoder with which 3 encodes a sound signal, and 4 change the above-mentioned condensed information into an information-compression means, and 5 changes it into sector information equal to the integral multiple of a frame period, In order that the format encoder with which 6 compounds image data, character data, and audio data, and 7 may make the intersymbol interference in a record medium small, the modulation circuit for changing into a predetermined modulation code and 8 are laser modulators which modulate laser according to the above-mentioned modulation code.
[0003] Moreover, as for a disk motor for a traverse motor for an actuator for an optical head for 9 to carry out outgoing radiation of the above-mentioned laser light and 10 to carry out the tracking of the light beam by which outgoing radiation is carried out from the optical head 9, and 11 to convey the optical head 9, and 12 to rotate a disk 13, and 14, a servo circuit and 15 are system controllers.
[0004] Moreover, playback amplifier for 16 to amplify the regenerative signal from the optical head 9, A demodulator for 17 to obtain pit data from the recorded modulating signal, the decoder from which 18 separates image data and audio data, An information expanding means for 19 to elongate a frame sector inverse transformation means, and for 20 elongate the above-mentioned condensed information, A D/A converter for 21 to change the elongated information into for example, an analog video signal or an audio signal and 22 are audio decoders which decrypt audio data to an analog audio signal.
[0005] Drawing 7 is MOVING to which digital animation information is compressed into, and normalization is advanced in order to accumulate, transmission and. PICTURE CODING EXPERTS GROUP ("MPEG" is called hereafter) In drawing having simplified and shown the data array structure (layer structure) of a method GOP which 23 becomes from two or more frame information, the GOP layer by which 24 is constituted from some pictures (screen), 25 -- one -- a screen -- some -- Brock -- having divided -- a slice -- 26 -- some -- a macro -- a block -- (-- MB --) -- 27 -- from -- constituting -- having -- a slice -- a layer -- 28 -- eight -- a pixel -- x -- eight -- a pixel -- constituting -- having -- a block -- a layer -- it is .
[0006] The image information to which drawing 8 is drawing having shown the coding structure when setting 17 screens to 1GOP, and 29 carries out the inside DCT of a frame ("I-picture" is called hereafter), the image information by DCT coding whose 30 performs the motion compensation of front ("P-picture" is called hereafter) and 31 are image information ("B-picture" is called hereafter) to which DCT coding which performed the motion compensation by using as a reference screen the above-mentioned I-picture and P-picture which are located forward and backward in time is carried out.
[0007] Next, actuation is explained. It is possible to excel in retrieval nature compared with a tape medium which is represented by the conventional VTR etc., and to realize very user-friendly image filing equipment by recording the compressed image information on an optical disk as the compression

technology of digital image information progresses. Moreover, such disk file equipment does not have dubbing degradation compared with the case where an analog video signal is recorded, in order to treat digital information, and since it is optical recording playback further, the system which was excellent in dependability non-contact is realizable.

[0008] When recording such compression animation information on an optical disk conventionally, the digital compression animation information on the MPEG method which is an optical disk record regenerative apparatus as shown in drawing 6 , for example, was shown in drawing 8 will be recorded. At this time, the image information digitized with A/D converter 1 is changed into the compression animation information for example, on an MPEG method by the information-compression means 4. This condensed information performs the modulation for making effect of the intersymbol interference of a disk small while being encoded, and it is recorded on an optical disk 13. By making it the amount of data at this time, for example, each GOP unit, turn into the almost same amount, and distributing to a sector equal to the integral multiple of a frame period, edit in a GOP unit etc. can carry out per sector, and it becomes easy to process it.

[0009] Moreover, in case the speech information corresponding to image information is recorded, it encodes with the audio encoder 3 and is compounded with image information with the format encoder 6.

[0010] Moreover, the image information reproduced from the optical disk 13 at the time of playback is amplified with the playback amplifier 16. After restoring to digital data by the demodulator 17 and the decoder 18, It restores as pure image former data which removed data, such as the address and parity, with the frame sector inverse transformation means 19. It reappears to a video signal by furthermore performing for example, MPEG double sign-ization with the information expanding means 20, and changes into the analog video signal which can be displayed on a monitor etc. with D/A converter 21. On the other hand, the speech information from which it dissociated with image information by the decoder 18 at the time of playback is restored by the audio decoder 22.

[0011] If an MPEG method is used as the digital animation compression approach here as mentioned above The I-picture 29 which performs compression [/ in / DCT / a frame], The B-picture 31 to which DCT coding which performed the motion compensation by using as a reference screen the P-picture 30 which is the image information by DCT coding which performs the motion compensation of front, the above-mentioned I-picture located forward and backward in time, and P-picture is performed Some union ******** coding structures will be recorded on an optical disk 13.

[0012] Since the above-mentioned I-picture is performing the inside DCT of a frame at this time, it is possible to perform image reconstruction by this information independent, but since P-picture is performing the motion compensation of front, if it is not after it reproduces the above-mentioned I-picture, it cannot perform image reconstruction. Moreover, although B-picture has the unreproducible description if it is not after it reproduces the above-mentioned I-picture or P-picture which is forward and backward since it is a prediction screen from both directions, since it is performing both-directions prediction, there is least amount of data, and its coding effectiveness is good.

[0013] However, since this B-picture is independently unreproducible, I-picture and P-picture are needed, but if the number of sheets of that part and B-picture is increased, while the amount of buffer memory in a processing circuit will increase, there is a problem on which the time delay from a data input to image reproduction increases. However, in the are recording system media represented by the optical disk etc., since a good coding method of compression efficiency is desired for long duration record and also the time delay of the above-mentioned image reproduction seldom becomes a problem, the coding method as shown in drawing 7 is suitable.

[0014] In the conventional karaoke sing-along music system, text was made to mix in image information and words were displayed as graphic display. However, since it is encoding by making text mix in a picture image, there is a problem which a mosquito noise generates by compression processing. Moreover, since the edge parts of an image and an alphabetic character occur in a large quantity in case the information which made the alphabetic character mix in an image is compressed, there is a problem to which compression efficiency falls. Moreover, compared with the screen for computers, its resolution is low, and since the common television screen does not fit the display of the high definition alphabetic character from a text file, it is common [the screen] to display a big alphabetic character using a character generator etc.

[0015]
[Problem(s) to be Solved by the Invention] In the conventional digital animation record regenerative apparatus which displays character information, such as a title, on image screens, such as the above films, since character information was mixed in image information and it was made to display as an image, there was a trouble that the data compression rate by character mixing fell.
[0016] Moreover, the trouble that the mosquito noise by character mixing occurred was in the image which serves as a background at the time of an image data compression.
[0017] Moreover, in a display means to use the character data which needs font data, such as Japanese by text data, and a kanji, font data was needed for the display control section, and small-scale-izing of a record regenerative apparatus was difficult.
[0018] Made in order that this invention might solve the above troubles, the 1st object is acquiring the record playback approach which enables the display of a clear image and a character.
[0019] Moreover, the 2nd object is acquiring the compact record playback approach which does not need the font data for a character display.
[0020] Moreover, the 3rd object is acquiring the record playback approach the utilization ratio of medium capacity being improvable.
[0021] Moreover, the 4th object is acquiring the record playback approach which enables repeat display processing of only character information apart from image information.
[0022] Moreover, the 5th object is acquiring the record playback approach whose setting out of the display format of character information is enabled.
[0023] Moreover, the 6th object is acquiring the record playback approach whose setting out of the display order of a character is enabled.
[0024] Moreover, the 7th object is acquiring the record playback approach which enables long duration record on a disk.
[0025] Moreover, the 8th object is acquiring the record playback approach which makes character information by text input recordable.
[0026]
[Means for Solving the Problem] It was made in order to improve the functional effectiveness of the character displayed on an image at the time of playback, in case this invention carries out record playback and displays such a compression digital image on an optical disk at a display means, and the character information which prepares the field which records character information in image information (GOP), and displays on a screen records, and in case invention of claim 1 displays an image, it inserts a character in a screen.
[0027] Moreover, the data which specified the character data which specified the existence of a display of the information on a character in a dot unit, and a dot foreground color constitute invention of claim 2, and it is displayed on a screen with a character generator.
[0028] Moreover, it is made for invention of claim 3 to make the flag which shows the existence of the information on a character information field exist in a system header.
[0029] Moreover, it is made for invention of claim 4 to make the starting address of a character information field, and the information which shows the amount of data exist in a system header.
[0030] Moreover, invention of claim 5 sets the display position in a screen, and the information which directed the display size as character information.
[0031] Moreover, invention of claim 6 adds the information which showed whether a character information display would be performed to the timing which displayed which of the picture which exists in GOP on character information.
[0032] Moreover, invention of claim 7 makes the character information which performed compression processing exist in GOP, and before transmitting to a character generator at the time of playback, it is made to perform thawing processing.
[0033] Moreover, in case invention of claim 8 is recorded through the digital image information which added character information, it changes the inputted text information into a character data format.
[0034]
[Function] In invention of claim 1, divide image information and character information, it is made to exist in GOP, image information constitutes the information only on an image, and character information from information only on a character, and playback is processed independently.

[0035] Moreover, it constitutes from invention of claim 2 using the data which decomposed the character into the display dot pattern, and the data which specified the foreground color of a dot.
[0036] Moreover, in invention of claim 3, the field which records the information which shows the existence of character information is newly established in the header information field which exists in a GOP head and records attribute information etc. in the GOP structure of an MPEG method.
[0037] Moreover, in invention of claim 4, the field which records the information which shows the starting address and amount of information of a character information record section is newly established in the header information field which exists in a GOP head and records attribute information etc. in the GOP structure of an MPEG method.
[0038] Moreover, the data which decomposed the character into the display dot pattern, the data which specified the foreground color of a dot, the scale-factor assignment information in every direction at the time of a screen display, and the assignment information on a screen-display coordinate constitute character information from invention of claim 5.
[0039] Moreover, in invention of claim 6, the field which records the character display timing information synchronized with picture display timing is established in the header information field which exists in the head location of a character information field, the character data given to a character generator from the information is controlled to it, and a character is displayed on it.
[0040] Moreover, in invention of claim 7, a compression means is used for the constituted character information, compression processing is performed to it, and the amount of data is reduced to it.
[0041] Moreover, in invention of claim 8, in case character information is inserted in GOP, the inputted text data is changed into character data with a conversion means, and the character information constituted by generation means to add header information and display timing information is used.
[0042]
[Example]
Example 1. drawing 1 is drawing having shown the DS of the digital animation image in the example 1 of this invention. That the same sign as drawing 7 is the same respectively, or the header signal with which the considerable part is shown and 32 shows the head location of data, The GOP address for 33 to show the edit unit for every GOP, and the address to make, An audio header for the attribute data with which 34 accompanies digital animation image data, and 35 to show the head location of audio data, A video header for 36 to show audio data and for 37 show the head location of a video data, A character header for B header for P header for 38 to show a video data and for 39 show the head location of P-picture and 40 to show the head location of B-picture and 41 to show the head location of alphabetic data and 42 are character data.
[0043] Next, actuation of an example 1 is explained. The image data inserted into GOP and audio data have the header information which is each detailed information. Therefore, as shown in drawing 1 , while a head location is shown in character data 40, it becomes the character information which became independent of image information by forming the character header 41 which recorded the detailed information of character data 40. Since it is processed independently, the mosquito noise to the image by extension processing stops for this reason, occurring apart from image information.
[0044] Moreover, since image information does not contain a character, the edge part by the color tone difference of the image which serves as a load at the time of compression processing decreases, and a data compression rate improves.
[0045] Furthermore, since a character also performs display processing of only a character, it becomes possible [displaying the clear character which is not influenced by the image].
[0046] Moreover, by decoding the information on the character header 41, a system can obtain the detailed configuration information of character data 40, and becomes possible [taking out only required data]. For this reason, substitution of only character data etc. is attained by making GOP into a unit, for example, postrecording and edit are attained.
[0047] Moreover, when a system decodes the field which recorded the information which shows the existence of the character data prepared in the system header information field, activation of character data processing is controllable. For this reason, since it becomes unnecessary to secure the character data field decided in GOP, the utilization ratio of a medium improves.
[0048] Moreover, the display of a character constitutes character data with the data based on burning dot tab control specification, and the data of a burning dot foreground color, gives this data to a character

generator, and performs display processing. By using the above-mentioned configuration of character data, display character data will be written in a character generator, and the need of managing font data by the system is lost. For this reason, a response not only in the alphabet and Japanese but all character formats is attained. For example, in the case of the title of a film etc., there is no need of changing image data, it can edit also into the software of language of what by substituting only character information, and simplification and time amount compaction of an editing task are attained.

[0049] As mentioned above, when displaying a character by animation processing, it becomes possible by making character information exist in GOP to display the character which is not an image.

[0050] Moreover, it becomes possible by having divided the image and the character to display a clear character. As compared with the method which was made to mix a character in the conventional image and had been compressed into it by this, generating of the mosquito noise by character mixing is lost, a data compression rate is also improved substantially, and a disk capacity utilization ratio is also improved.

[0051] Moreover, in case a title is inserted in a film, karaoke, etc., it is not necessary to make a character mix in an image, and the easy input of the character information on digital animation information is attained.

[0052] Moreover, by using character data, the system of the display control section can be simplified and the response to the language of each country also becomes easy.

[0053] Example 2. drawing 2 is the Brock circuit diagram of the character information recording system in the example 2 of this invention, and shows that the same sign as drawing 6 is the same respectively, or a considerable part. In drawing, CPU to which 50 performs the character display control doubled with an image and voice, the character encoder which changes 51 into a bit format of the inputted character data, an information-compression means by which 52 compresses character data, and 53 are image encoders which process image data.

[0054] Drawing 3 is the Brock circuit diagram of the character information reversion system in the example 2 of this invention, and shows that the same sign as drawing 6 and drawing 2 is the same respectively, or a considerable part. The data detector where 61 detects data from a regenerative signal in drawing, The error correction circuit which performs correction processing of data in which 62 was detected, the data dividing network which performs AV dissociation of the GOP data with which 63 was corrected, The analysis circuit which 64 analyzes character header information and gives directions to a generator, The extension circuit where 65 performs extension processing of the reproduced character data, the character generator with which 66 performs a character display process, the image decoder to which 68 processes image data, the loudspeaker which outputs the signal with which speech processing of 69 was carried out, and 70 are monitors which display an image.

[0055] Next, actuation of an example 2 is explained. The field which records the information which directs the display position and size in a screen is established in a character information field, and it is made to exist in character information as additional information of a character. In case it displays on a monitor 70 with a character generator 66, character data and the above-mentioned directions information are given, and the display according to directions information is performed. This becomes possible to express a character in the location of arbitration as the size and the color of arbitration.

[0056] Moreover, it becomes possible to set up the display format of arbitration by the user side by a system's decoding setting out to which the user carried out directions information at the time of a display action at the time of setting out from other than character information, for example, playback, and giving the directions information generated to display setting out to a character generator 66. For example, as shown in drawing 5 (a), when titles, such as explanation, lap with the important part of an image, a title display position can be changed like drawing 5 (b), and a viewer can constitute a legible screen.

[0057] Moreover, in case a character is inserted in GOP at the time of record, the data by which text input was carried out are changed into the data based on burning dot tab control specification, and the data based on the data of a burning dot foreground color with the character encoder 51, and the character information to which directions information was added is inserted in GOP. The inputted character is that the text data of any formats can be responded in order to perform transform processing with the character encoder 51.

[0058] Moreover, the character information inserted into GOP is character data, and since bit assignment, assignment of a color, each above-mentioned directions, etc. are included as information,

when using user characters other than a Hollerith type type, it serves as quite big amount of information. Therefore, compression processing is performed to character information by the information-compression means 52, and it is inserted in GOP.

[0059] Moreover, extension processing is performed by the extension circuit 65 at the time of playback, it analyzes the character information returned to the condition before compression, and performs display processing. Thereby, the amount of data of character information is reduced and the utilization ratio of medium capacity improves.

[0060] As mentioned above, when displaying a character by animation processing, it becomes possible by giving the above-mentioned setup instruction to the character information in GOP to expand the auxiliary effectiveness to the image of a graphic character. Moreover, by enabling setting out of the display position and size of character data, it becomes possible to establish the setting-out means by the user, and it becomes possible [building a user-like system]. Moreover, by processing with the compression extension means 52 and 65, character amount-of-information amplification is suppressed and it becomes possible to raise the capacity utilization ratio of a medium.

[0061] Example 3. drawing 4 is drawing having shown the configuration of the character header 41 in the example 3 of this invention, and the start address 78 indicates a character address and 79 indicates the head location of character data to be, the length 80 indicates the amount of character data to be, the timing chart 81 instructs display timing to be, the compression flag with which 82 shows compression / un-compressing, and 83 are reserve area. [of data]

[0062] The field which records the information which specifies which character is displayed at the time of which picture display is prepared in a character header information field to two or more picture data which are image data in GOP, at the time of playback, character data 42 is given to a character generator 66 according to the directions, and a character display is controlled. This becomes possible using the above-mentioned display directions information to control display timing. For example, when displaying the words of the karaoke to which an alphabetic character and a color are changed by time amount etc., it becomes possible to control timing for the above-mentioned display directions information, and to display an alphabetic character. Moreover, it becomes possible apart from an image by controlling display timing for the graphic by character data 42 for the above-mentioned display directions information to display animation processing. For example, as shown in drawing 5 (c), it becomes possible not to make the display of the count which shows the beginning of the song of karaoke etc. mix in an image, but to indicate by the character.

[0063] As mentioned above, when displaying a character by animation processing, it becomes possible by giving the above-mentioned display directions information to the character information in GOP to expand the auxiliary effectiveness to the image of a graphic character. Moreover, by controlling display timing with display directions, it becomes possible to display the changing character data apart from an image, and becomes expandable [the activity range].

[0064]

[Effect of the Invention] According to invention of claim 1, it becomes possible not to be influenced by a clear image and a clear image but to display a clear character by using the information which exists as character information.

[0065] According to invention of claim 2, the user character display of those other than an alphabetic character is attained. Moreover, since the data to be used are character data, it becomes unnecessary to store font data to ROM etc., and simplification of a configuration is attained.

[0066] According to invention of claim 3, improvement in the utilization ratio of a medium of compaction of character information processing and existence of a definite field is attained without the need by checking the existence information on character information.

[0067] According to invention of claim 4, ejection becomes possible only about character information by analyzing the character header information within character information.

[0068] According to invention of claim 5, various methods of presentation become possible as a format which displays a character.

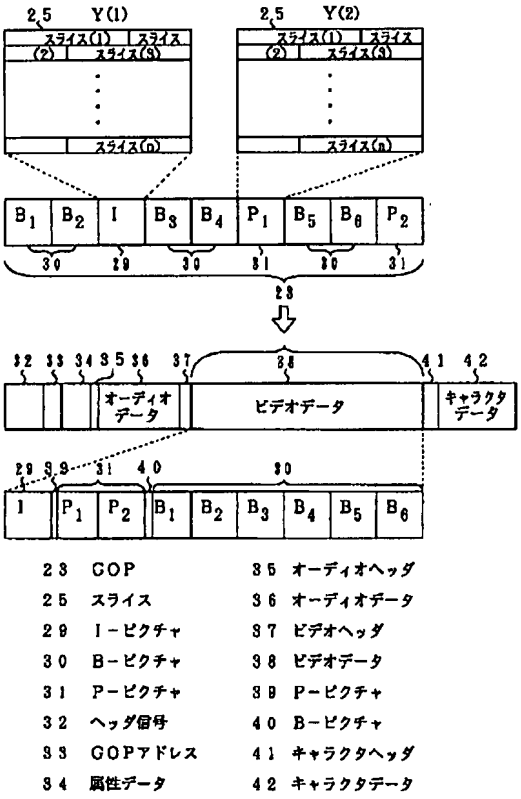
[0069] According to invention of claim 6, apart from an image, control processing of the display timing by the character generator is attained.

[0070] According to invention of claim 7, the utilization ratio of a medium improves by compressing character information and lessening amount of information.

[0071] According to invention of claim 8, it becomes recordable [character information] by creating character data from text input data.

[Translation done.]

Drawing selection Representative drawing



28 GOP
25 スライス
29 I－ピクチャ
30 B－ピクチャ
31 P－ピクチャ
32 ヘッダ信号
33 GOPアドレス
34 属性データ
35 オーディオヘッダ
36 オーディオデータ
37 ビデオヘッダ
38 ビデオデータ
39 P－ピクチャ
40 B－ピクチャ
41 キャラクタヘッダ
42 キャラクタデータ

[Translation done.]